REMARKS

In view of the foregoing amendments and the following remarks, Applicants respectfully request reexamination of the present application. Claim 16 has been amended, no claims have been cancelled and new Claims 29-35 have been added.

Independent Claim 16 has been amended to recite that the fiber/resin matrix is cured at a curing temperature of from about 350°F to about 500°C. Support for this amendment can be found, for example, at paragraph [0088] of the published application. New Claim 29 has been added. New Claim 29 recites that the matrix material has an elongation of greater than about 3%. Support for this new claim can be found, for example, at paragraph [0037] of the published application.

New Claim 30 is substantially similar to prior independent Claim 16 amended to incorporate dependent Claim 16 and to recite that the composite core includes one or more layers of aluminum conductor surrounding the core. Support for this amendment can be found, for example, in Fig. 1 and at paragraph [0025] of the published application.

Claim Rejection – 35 USC § 102

At page 2 of the Office Action, the Examiner has rejected independent Claim 16 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,195,141 by Büning et al. and U.S. Patent No. 4,247,436 by Büning (collectively referred to herein as "Büning" et al. Applicants note that the disclosure of these two patents by Büning is identical). Applicants respectfully traverse this rejection.

The Examiner asserts that Büning et al. discloses a composite rod comprised of a matrix material that further comprises at least one resin, at least one hardener and one or more accelerators, and a plurality of longitudinally extending fibers of one fiber type embedded in the matrix, wherein the fiber/resin matrix is cured to form the composite rod.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the

claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ 2d 1913, 1920 (Fed. Cir. 1989).

Independent Claim 16 requires that the matrix material include a chemical formulation *having elongation properties in excess of glass fiber elongation properties*. In this regard, there is no disclosure or suggestion in Büning et al. that the epoxy resin mixture used by Büning has elongation properties in excess of glass fiber elongation properties, and the Examiner has not addressed this claim limitation in the Office Action.

Applicants also submit that this feature is not inherent in the disclosure of Büning. It is well established that the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir.1993). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

A resin composition having elongation properties in excess of glass elongation properties is simply not disclosed or suggested by Büning et al.

In addition to the foregoing, independent Claim 16 has been amended to recite that the fiber/resin matrix is cured at a curing temperature of from about 350°F to about 500°F (i.e., about 176°C to about 260°C). In contrast, Example 4 at Col. 10 of Büning et al. discloses that the hardening (i.e., curing) of the glass fiber-reinforced rods was performed at 130°C (i.e., 266°F).

Since Büning et al. does not disclose or suggest a matrix material that has an elongation in excess of glass fibers elongation, or that is cured at a curing temperature of from about 350°F to about 500°F, removal of this rejection under 35 U.S.C. § 102 is requested.

Further, the use of thermoset resin that is cured at a temperature in excess of 350°F can provide certain advantages. Such a high curing temperature can ensure that the matrix material has a sufficient resistance to high temperatures such as those that may be encountered in applications such as aluminum conductor composite cores. As a result, the matrix material, and hence the composite core, can be capable of operating at temperatures ranging between 180°C and 240°C or higher without thermally or mechanically damaging the strength of the member. See, for example, paragraph [0079] of the present application.

In contrast, Büning et al. discloses a much lower cure temperature, and hence, a resin that likely could not withstand higher operating temperatures for any period of time without degradation of the mechanical properties of the resin. Further, Büning et al. discloses manufacturing glass fiber-reinforced resin rods merely as an example of the use of the silane solution of the claimed invention. Büning et al. does not disclose or suggest any utility for a resin having a much higher curing temperature in a fiber-reinforced resin composite.

In view of the foregoing, removal of this rejection of independent Claim 16 and the claims dependent therefrom is requested.

Claim Rejections – 35 U.S.C. § 103

At page 3 of the Office Action, the Examiner has rejected Claims 23 and 24 under 35 U.S.C. § 103(a) as being unpatentable over Büning et al. Applicants respectfully traverse this rejection.

Claims 23 and 24 depend upon independent Claim 16. As is noted above, independent Claim 16 has been amended to recite that the fiber/resin matrix is cured at a curing temperature of from about 350°F to about 500°F. Büning et al. does not disclose or suggest a matrix material that has an elongation in excess of glass fiber elongation or that is cured at a curing temperature of from about 350°F to about 500°F. Therefore, dependent Claims 23 and 24, which include all of the limitations of independent Claim 16 are also allowable over Büning et al.

At page 4 of the Office Action, the Examiner has rejected Claims 16, 23-24 and 26-28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,515,435 by Anderson, in view of Büning et al. as applied above to Claim 16. Applicants respectfully traverse this rejection.

The Examiner states that Anderson discloses a composite core comprising a matrix resin and a plurality of longitudinally extended fibers of one type embedded therein to form a fiber/resin matrix, per Claim 16. While the Examiner recognizes that Anderson is silent as to the curing agents for his epoxy, the Examiner states that it is well known in the art to include one or more hardener and accelerators in an epoxy to facilitate curing of the resin. The Examiner concludes that this would have been an obvious expedient to one of ordinary skill in the art, and the teachings of Büning et al. would have provided direction to the skilled artisan to modify the teachings of Anderson by including a hardener and accelerator in his epoxy resin to facilitate curing.

Anderson discloses an optical cable assembly including optical (glass) fibers surrounding an axial core member that is a fiberglass-epoxy composite. As is discussed above with respect to Büning et al., there is no disclosure or suggestion in Anderson that the epoxy resin of Anderson has elongation properties in excess of glass fiber elongation properties. Further, there is no disclosure or suggestion by Anderson that the resin is cured at a temperature of from about 350°F to about 500°F. In fact, there is no disclosure by Anderson of any relevant properties of the resin, except for the thermal expansion properties.

As is discussed in detail above, Applicants also submit that these features are not disclosed or suggested by Büning et al. Therefore, Applicants request removal of this rejection with respect to independent Claim 16 and the claims dependent therefrom.

At page 5 of the Office Action, the Examiner has rejected Claims 16-26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,540,870 by Quigley, in view of Büning et al. as applied above to Claim 16. Applicants respectfully traverse this rejection.

The Examiner states that Quigley teaches a structural member of fiber-reinforced composite material comprising a rod formed with an outer sheath of fiber-reinforced

material and an inner core material fiber-reinforced material. The fibers can be carbon or glass and each layer can be formed from an epoxy resin. The Examiner recognizes that Quigley is silent as to the specific epoxy components.

The Examiner concludes however that is well known in the art to include one or more hardener and accelerators in an epoxy to facilitate curing of the resin, and that this would have been an obvious expedient to one of ordinary skill in the art. Moreover, the teachings of Büning would have provided direction to the skilled artisan to modify the teachings of Quigley by including a hardener and accelerator in his epoxy resin to facilitate curing.

Quigley discloses a structural element formed of a fiber reinforced thermoplastic material (see the Title and Abstract of Quigley). The element is an intermediate product that can be deformed to a desired geometry in a secondary processing step and then cooled to a hardened state. As is discussed above with respect to Büning et al., there is no disclosure or suggestion in Quigley that the matrix material of Quigley has elongation properties in excess of glass fiber elongation properties. Further, there is no disclosure or suggestion by Quigley that the resin is cured at a temperature of from about 350°F to about 500°F. Indeed, *thermoplastic materials are not even subject to a curing step*.

As is discussed in detail above, Applicants also submit that these features of the resin composition are not disclosed or suggested by Büning et al. Therefore, Applicants request removal of this rejection with respect to independent Claim 16 and the claims dependent therefrom.

As is noted above, new independent Claim 30 has been added. New independent Claim 30 is similar to prior dependent Claim 28, written in independent form. In this regard, the Examiner had rejected dependent Claim 28 under 35 U.S.C. 103(a) as being unpatentable over Anderson in view of Büning.

The Examiner asserts that Anderson discloses a composite core comprising a matrix resin and a plurality of longitudinally extending fibers of one type embedded therein to form a fiber/resin matrix, where the fibers can be glass fibers and the resin is epoxy. The Examiner also asserts that Anderson discloses that a coating can surround the core and that Anderson discloses a layer of conductors surrounding the core. The Examiner asserts

that the teachings of Büning would have provided direction to the skilled artisan to modify the teachings of Anderson by including a hardener and accelerator in his epoxy resin to facilitate curing, thereby rendering obvious the invention as claimed in Claim 28.

Applicants traverse this rejection. In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). In this regard, neither Anderson nor Büning disclose or suggest a conductor surrounding a composite core.

The Examiner asserts that Anderson a layer of conductors surrounding the core. Anderson discloses an optical cable assembly including optical (glass) fibers **13** surrounding an axial core member **12** that is a fiberglass-epoxy composite. The optical fibers are sheathed in a protective layer **10** of a polymeric material (Col. 3, lines 21-29). The sheathed optical fibers are surrounded by an inner jacket **16** formed of a polymeric material (Col. 3, lines 33-35), which in turn is surrounded by a braided strength member **18** formed from a suitable aramid fiber (Col. 7, lines 45-54). Finally, the assembly includes an outer jacket **20**, also formed from a polymeric material (Col. 7, lines 66-67).

None of the various components and layers in the optical cable disclosed by Anderson comprises a conductor. Indeed, the optical cable is comprised entirely of non-conductive materials, i.e., glass fibers and polymers. The optical cable disclosed by Anderson is adapted to transmit visible light signals, particularly for monitoring the water level in a coal-fired boiler (Col. 1, lines 23-32). Thus, there would be no reason to modify the optical cable disclosed by Anderson to include a layer of electrical conductor.

Büning merely discloses the fabrication of glass fiber-reinforced epoxy resin rods by immersion of glass fiber strands in an epoxy resin as a means to demonstrate the utility of the silane coating compositions of Büning. There is no disclosure or suggestion of the use of a conductor layer surrounding the fiber-reinforced resin rods.

In view of the foregoing, Applicants consideration and allowance of independent Claim 30, as well as Claims 31-35, which are dependent upon Claim 30 and include all the limitations thereof.

Applicants do not believe that any additional fees are due with regard to the entry of this paper. However, if any fees are due, please debit those fees from Deposit Account No. 50-1419.

Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecute and or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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